1,165,135

PATENT SPECIFICATION

DRAWINGS ATTACHED

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Inventor: LESLIE JOHN STREET

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COMPLETE SPECIFICATION

Improved Chair giving Adjustable Spring-Back Facilities

We, THE TAN-SAD CHAIR COMPANY (1931) LIMITED, a British Company, of Soho Foundry, Birmingham, 40, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement: :—

This invention relates to chairs and more especially to chairs of the kind incorporating means for adjusting the resilience of resistance to relative movement between two parts of a chair, e.g. between a back-rest and a seat or between a seat and a chair base, the invention having for its object a particularly simple and efficient design of such adjusting means.

In accordance with the present invention a chair comprises means for adjusting the resilience of resistance to relative movement between two parts of the chair wherein either of the two parts is an arm of a lever, including a resilient spacing member having at least part-cylindrical peripheral surface, the spacing member being mounted on one of the two chair parts so that the other of the two chair parts can locally contact the peripheral surface, and control means including a shaft co-axial with the peripheral surface of the spacing member and rotatably mounted on said one of the two chair parts, angular movement of the shaft serving to adjust radial resilience of the spacing member between the shaft and said other of the two chair parts.

Preferred embodiments of the invention are now particularly described with reference to the accompanying drawings, wherein:—

Figure 1 is a side elevation of a part of a chair, showing the device giving adjustable spring-back facilities;

Figure 2 is an enlarged sectional elevation of a part of the chair shown in Figure 1;

Figure 3 is a section on line III—III of Figure 2;

Figure 4 is a sectional view of a part of the device giving adjustable spring-back facilities in a second alternative embodiment of the invention; and

Figure 5 is a sectional view of a part of the device giving adjustable spring-back facilities in a third alternative embodiment of the invention, and

Figure 6 is a side elevation of a part of the device giving adjustable spring-back facilities in a fourth alternative embodiment of the invention.

Referring initially to Figures 1, 2 and 3, a chair comprises a back-rest assembly 12, and a seat assembly 11 including a frame 13 mounted on a swivel support stem 16. The frame 13 comprises a channel section support 14 extending downwardly of the seat. The backrest assembly comprises a backrest 12*a* and a dependent lever 17 cranked towards the support and having an apertured boss 18 whereby the lever is fulcrummed on a shaft 20 passing transversely through the channel section support 14 so that the free end of the lever 17 bears against a resilient spacing member 21 mounted on the frame 13. A stop 24 is supported on the channel base 19 so as to extend transversely of the channel. The stop 24 maintains the lever against the spacing member 21.

A rotatable rod 23 is mounted in bearings in the support 14, parallel to the shaft 20 and carries a knob or hand-wheel, (not shown), at one end to facilitate turning of the rod 23. The spacing member 21 has a cylindrical outer configuration and is fixed co-axially on the rod 23 by a radially extending pin 22. The spacing member 21 is disposed within the channel of the support 14, so that the lever 17 bears against the periphery of the spacing member. Hence, pressure on the backrest 12*a* by a person seated on the chair would tend to fulcrum the backrest assembly 12 in one direction against the resilient resistance offered by the spacing member 21. Return angular movement of the backrest assembly in the reverse direction is limited by the stop 24.

[*Price 4s. 6d.*]

The spacing member 21 comprises a metal core 25 of snail cam cross-section and a resilient, for example rubber sleeve 26 bonded to the core to provide a cylindrical outer configuration. Hence the radial resilience of the spacing member as a whole will vary about its periphery between almost zero where a radial portion of the spacing member is constituted almost entirely by metal and a maximum where a radial portion of the spacing member is constituted principally by rubber. In the former condition, the lever will be almost rigidly locked between the almost entirely metal radial portion of the spacing member and the lugs 24, whereas in the latter position an appreciable degree of resilience is provided for the backrest assembly.

A catch is provided to maintain the spacing member 21 in a selected one of a plurality of alternative, predetermined, angular positions. The catch can take the form of a ball-catch selector comprising a ball 28 and a helical thrust spring 29 accommodated in a bore 27 formed, with its axis parallel to the rod axis, in one side 30 of the spacing member 21. The side 30 of the spacing member 21 is juxtaposed with one internal face 31 of the channel-section support 14 and the face 31 of the latter has several apertures 32 disposed in a circle about the rod 23 axis. In turning the rod 23 by means of the knob the ball is spring-urged to engage in any one of the apertures 32.

In operation, to adjust the resilience of the backrest assembly 12 to requirements, the knob is actuated to turn the spacing member 21 so that the part of the periphery of the member bearing against the lever 17 is changed. The resilience can be varied between a minimum and a maximum as mentioned above and when the required position is reached, the spacing member is located by engagement of the ball 28 with the nearest aperture 32 so that the member will not wander from its set position.

In an alternative embodiment of the invention, as shown in Figure 4, the spacing member comprises a snail-cam section core 40 composed of a resilient material and an outer cylindrical sleeve 41 composed a relatively rigid material. In this embodiment resilience of the member will be greatest where the core 40 most nearly approaches the member periphery.

In a further alternative embodiment of the invention, as shown in Figure 5, the spacing member comprises a core 43 fixed to the rod 23 and rotatable therewith, and a spring 44. The spring 44 is an arcuately formed cantilever leaf spring comprising a plurality of laminae which are secured to the core 43 adjacent one end by fasteners 45 so that a major portion of the spring normally lies co-axially spaced from the rod 23. The resilience of the spring will vary from a maximum at the unattached end to a minimum adjacent the attached end. The core 43 serves to prevent excessive bending of the spring. In use rotation of the core and spring varies the effective length of the spring and hence its offered resilience.

In a yet further alternative construction, as shown in Figure 6, the spacing member comprises a rigid and arcuate casing 50 fixed on a part of the frame 13. A leaf spring 51 formed into substantially a cylindrical configuration is secured at a first end 54 to the casing 50 by fasteners 52 and a clamping strip 53 so that a portion of the spring contacts the concave face of the casing 50 throughout the length of the latter. The second end 55 of the spring 51 is unattached and a part of the spring adjacent this end bears against the lever 17. The spring 51 is disposed coaxially of the rod 23 and a strut-like arm 56 is radially mounted on the rod 23 so as to abut the spring 51 and support the latter against the casing 50. In operation, angular movement of the rod 23 turns the strut arm 56 to vary the effective length of the leaf spring 51, i.e. the length of the spring between its damping by the arm 56 and the second end 55 of the spring engaged by the lever. Hence angular movement of the rod 23 varies the resilience offered by the spring at its position of contact with the lever 17.

WHAT WE CLAIM IS:—

1. A chair comprising means for adjusting the resilience of resistance to relative movement between two parts of the chair wherein either of the two parts is an arm of a lever, including a resilient spacing member having an at least part-cylindrical peripheral surface, the spacing member being mounted on one of the two chair parts so that the other of the two chair parts can locally contact the peripheral surface, and control means including a shaft co-axial with the peripheral surface of the spacing member and rotatably mounted on said one of the two chair parts, angular movement of the shaft serving to adjust radial resilience of the spacing member between the shaft and said other of the two chair parts.

2. A chair according to Claim 1, wherein the angular position of the shaft determines the radial depth of resilient material of the spacing member between the shaft and said other of the two chair parts.

3. A chair according to Claim 2, wherein the spacing member is rotatable by the shaft, and comprises more and less resilient parts which are selectively brought to bear between the shaft and said other of the two chair parts during rotation of the latter.

4. A chair according to Claim 3, wherein the spacing member comprises a rigid core with a relatively resilient covering of varying thickness.

5. A chair according to Claim 3, wherein the spacing member comprises a resilient core

with a relatively rigid covering of varying thickness.

6. A chair according to Claim 4 or 5, wherein the spacing member has a circular periphery and its core has a snail-cam-like section.

7. A chair according to Claim 1, wherein the angular position of the shaft determines the effective length of an arcuate leaf spring defining the peripheral surface of the spacing member.

8. A chair according to Claim 7, wherein the leaf spring has a portion radially fixed with respect to the axis of the rotatable means with an adjoining portion radially resiliently movable with respect to the axis whereby the latter portion has a resilience increasing along its length from a minimum adjacent the fixed portion, the leaf spring being rotatable with the shaft.

9. A chair according to Claim 7, wherein the shaft drives a strut serving to support the leaf spring in selective positions angularly spaced from the positions of local contact of the other of the two chair parts with the peripheral surface of the spacing member.

10. A chair according to any one of the preceding Claims, comprising locating means serving to maintain the shaft in a selected one of a plurality of alternative predetermined angular positions.

11. A chair according to Claim 10, wherein the locating means is a ball and socket type selector.

12. A chair according to any one of the preceding Claims, wherein the peripheral surface of the spacing member has local contact with the lever arm.

13. A chair according to Claim 12, comprising a stop serving to limit angular movement of the lever away from the spacing member.

14. A chair according to any one of the preceding Claims, comprising a channel section support transversely pivotally mounting the shaft and the lever.

15. A chair as claimed in any one of the preceding Claims, wherein the two chair parts are respectively a back-rest assembly and a seat assembly,

16. A chair substantially as hereinbefore described and illustrated in Figures 1, 2 and 3, or 4, or 5, or 6 of the accompanying drawings.

For the Applicants.
SHAW, BOWKER & FOLKES,
St. Martin's House,
Bull Ring, Birmingham, 5.
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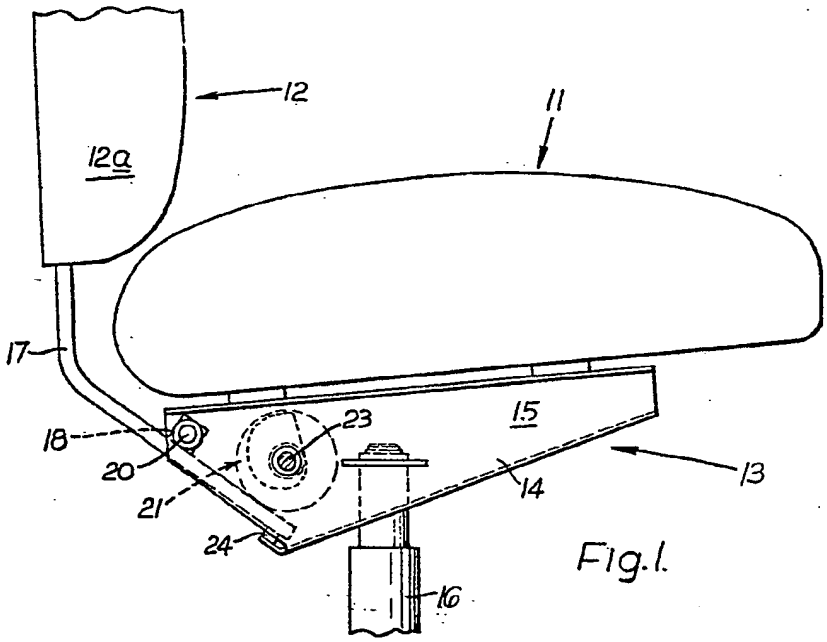


Fig. 1.

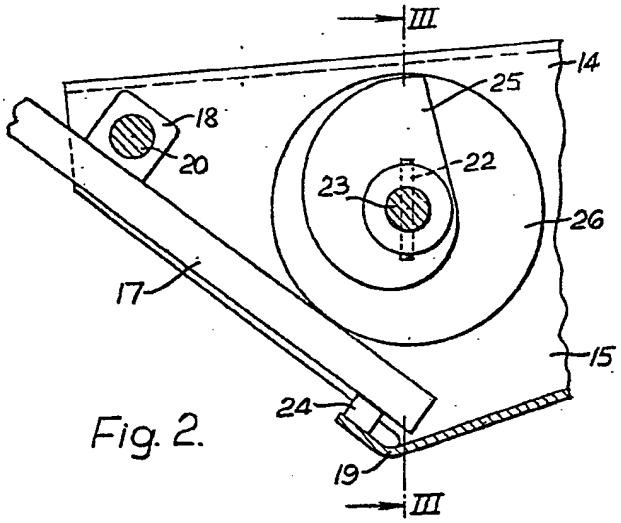


Fig. 2.

1165135 COMPLETE SPECIFICATION
2 SHEETS This drawing is a reproduction of the Original on a reduced scale
Sheet 2

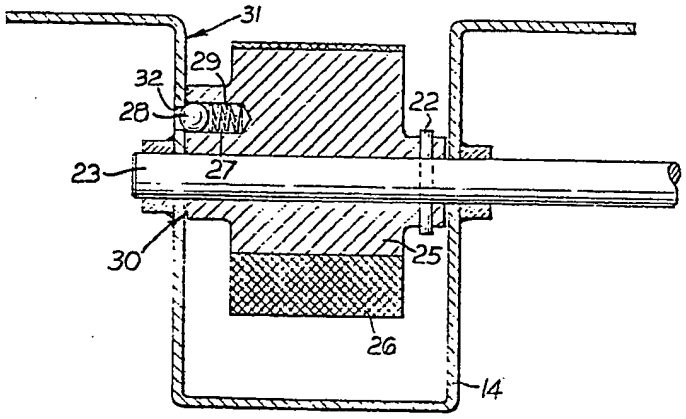


Fig. 3.

Fig. 4.

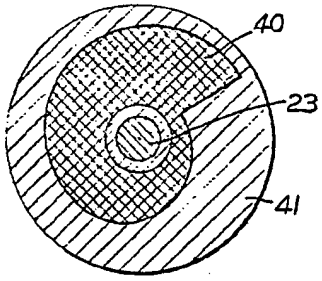
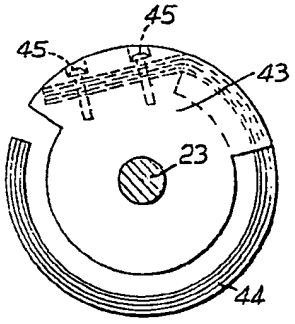


Fig. 5.



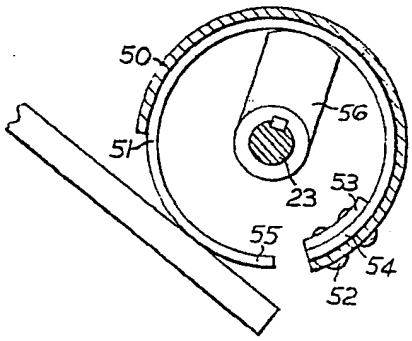


Fig. 6.